

for it. It is desired that this library shall be placed in a room vacated by Dr. Michael Foster's classes, and formed by the amalgamation of two old classrooms.

THE VICTORIA UNIVERSITY.—The Preliminary Examinations for the year 1881 will be held at the Owens College on June 20 and following days, and on October 5 and following days. Regulations:—1. Candidates for these examinations are required to present certificates of matriculation in the University. 2. The days fixed for matriculation are June 13 and 14, between the hours of two and four p.m., and October 1 and 3. 3. Students, on presenting themselves for matriculation, are required to furnish to the Registrar of the University certificates of admission as students of one of the colleges of the University, to pay a fee of 2*l.*, and to sign an undertaking to obey the regulations of the University. 4. The October Preliminary Examination is open only to students who have matriculated since the Preliminary Examination held in the previous June, or who failed in this examination, or were prevented attending it by reasons satisfactory to the General Board of Studies. Candidates are requested to communicate with the Registrar, Prof. Adamson, who will supply them with the detailed syllabus of subjects, regulations, and time-table for the examination.

ROYAL UNIVERSITY OF IRELAND.—The copy of the scheme for the organisation of the University as adopted by the Senate has now been laid, pursuant to Act of Parliament, before the House of Commons, and it has been, by order of that House, printed. It gives full details of the degrees to be granted, which are in Arts a Bachelor, a Master, and a Doctor of Literature degree; in Science a Doctor's degree; in Engineering a Bachelor and a Doctor's degree; in Law, Music, and in Medicine the same; in surgery a Master's degree, with a special diploma in Obstetrics and in Sanitary Science. All these degrees are open to persons of either sex. The examinations for women shall be held apart from those for men, but on the same days. Candidates for any degree must have passed the Matriculation Examination, which will be held not only in Dublin but at certain local centres. The examination will be held in the subjects of Latin, English, Elementary Mathematics, Experimental Physics, and in any one of the following languages: Arabic, Celtic, French, German, Greek, Hebrew, Italian, Sanskrit, or Spanish. Candidates must also pass a first University Examination, to which they will only be admitted after the lapse of one academical year from matriculation, the subjects for this being a more advanced course of that fixed on for matriculation. One year after this is passed the student in Arts may proceed to his second University examination, in which he will have his choice of a great variety of subjects, but Latin, Greek, and English on the one hand, or Mathematics on the other, are compulsory. At this stage of his career the student may select Biology, including Physiology, Botany, and Zoology, or Geology, and after the expiration of one more year he can proceed to his B.A. examination, for which he will be permitted to select either the Classics or Mathematics, with the selection of one other of a long list of subjects given. For the M.A. examination the candidate must be a B.A. of one year's standing at the least, and he may answer in any one of a selected group of subjects. The regulations for the degrees of Doctor of Literature and Doctor of Science are not yet matured. Twelve scholarships of 50*l.* each are to be offered each year for competition, four in Classics, four in Mathematics, and four in Modern Literature. Exhibitions varying from 100*l.* to 15*l.* will be given to Honour Men. There are to be forty-eight Fellows. The salary of a Fellow, if he be not also a Fellow or Professor of some other University or College attached to a University endowed with public money, shall be 400*l.* a year. If he be such, then he shall only receive so much as will bring his salary up to 400*l.* a year. These Fellows shall constitute a Board of Examiners. There shall be also fourteen junior Fellows, their salary to be 200*l.* a year. No Fellow or Professor of any other College or University is eligible, and the candidates must be Graduates of the Royal University of four years standing. All Fellowships are tenable for seven years. Thus if a senior Fellow be elected from an already endowed College, the chances are that while he will have to do his full share of the work, he will receive only as much salary as will bring his total emoluments to 400*l.* Thus a Professor of one of the Queen's Colleges (Belfast or Cork) if elected would only receive 5*l.* or 10*l.* a year, but if a Professor from the Catholic College in Dublin were elected, as it is not endowed, he could receive a full 400*l.* a year, and yet his duties would be

—so far as the Royal University is concerned—the same as his colleague from the endowed College, who would receive almost no salary at all. Thus a scheme for endowing Colleges through the resources of the Royal University has been at last successfully carried out. The subjects and books for the various examinations appear to be most judiciously selected, and in many respects might teach a lesson to our older Universities. The Senate close their scheme by a request that provision may be made for securing for the University a proper Senate Hall, Examination Rooms, a Library, &c., and urge that these should be all built within the area of the City of Dublin.

ETON.—Mr. G. C. Bourne of Eton College has been elected to a Natural Science Exhibition of 50*l.* a year for four years at New College, Oxford, for proficiency in Biology. Mr. Bourne is one of the foremost athletes of his school, having rowed in the Eton crew at Henley Regatta for the last three years, as he will again in a few weeks' time. For the past two years he has filled the exalted but responsible post of "captain of the boats," but has nevertheless found time to devote himself successfully to his favourite study, and has gained new honours for his school in a field hitherto untrodden by Etonians.

SCIENTIFIC SERIALS

Journal of the Franklin Institute, April.—The wearing power of steel rails in relation to their chemical composition and physical properties (continued), by Dr. Dudley.—Experiments on the strength and stiffness of small spruce beams, by Mr. Kidder.—Observations on the water-supply of Philadelphia, by Mr. Haines.—A fourth state of matter, by Mr. Outerbridge, jun.—The moon of Earth and Jupiter, by Dr. Chase.

Bulletin de l'Académie Royale des Sciences de Belgique, No. 2.—Note on the determination of the longitude of Karema, by Capt. Cambier.—New data on the non-existence of pentathionic acid, by M. Spring.—On a new fossil fish of the environs of Brussels and on certain enigmatic bodies of the crag of Antwerp, by M. van Beneden.—On phosphate-beds in Belgium (third note), by M. Petermann.—On the theory of polars, by M. Le Paige.—On a new form of reddish frog from the south-east of France (*Rana fusca Honorati*), by M. Héron Roger.—Study on the hypophysis of A-cidians and the neighbouring organs, by M. Julin.

Bulletin de l'Académie Impériale des Sciences de St. Petersbourg, t. xxvii, No. 2.—Development of the absolute perturbations of a comet, by O. Backlund.—Champignons recently collected in Mongolia and Northern China, by C. Kulchbrenner and F. de Thümen.—Observations of Jupiter's spots, by M. Kortazzi.—On the oxidation products of erythrite, by S. Przybytek.—The money of the Ilks, ancient Khans of Turkestan, by B. Dorn.—Remarks on the group of the Pteroclidæ, by M. Bogdanouff.—Relations between isobars and isanomalies of temperature, by H. Wild.—Influence of pressure on the electric resistance of metallic wires, by O. Chwolson.—The Russian species of humble-bees in the collection of the Academy, by F. Monawitz.—On the value of errors depending on the retardation or prematurity of impulses in Weber's methods for measuring instantaneous electric currents, by O. Chwolson.

Archives des Sciences Physiques et Naturelles, No. 4, April 14.—Study on the chemical composition of albuminoid substances, by Dr. Danilewsky.—Automatic methanometer, or automatic analyser of fire-damp, by M. Monnier.—Researches on vegetation, by Prof. Westmann.—Distillation and rectification of spirits by the rational use of low temperatures, by M. Pictet.—On phyllotaxy (continued), by M. de Candolle.

Rivista Scientifico-Industriale, No. 7, April 15.—Second reply in defence of the true theory of the siphon, by Prof. Marangoni.—Determination of the specific gravity of solids soluble in all liquids, by Dr. del Lupo.—Relation of the specific gravity and the pressure of saturated steam, by Prof. Ciccone.

THE last number of the Russian *Journal of the Chemical and Physical Society* (vol. xiii, fasc. 4) contains the following papers:—On the rate of chemical reactions, by M. N. Kayander.—On the influence of chemical structure on the refrigerating power of organic bodies, by M. J. Kanonnikoff.—On the laws of double decompositions, by M. A. Potilitzin.—On the chemical value of the constituents of alcohols, by Prof. Mensbutkin.—On ice under "critical pressure," by Prof. Boutleroff.—On electricity of con-

tact, by MM. Stoletoff and Sokoloff.—On the influence of pressure on galvanic resistance, by M. Khwolson.—On dynamo-electric machines without iron, by M. Latchinoff.—On the voltaic arc, by M. Sloughinoff.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, May 12.—"Physiological Action of β Lutidine." By Greville Williams, F.R.S., and W. H. Waters, B.A. Up to the present the authors' investigations have chiefly related to the action of this poison upon the heart and central nervous system of the frog.

Various methods were used to study its effect upon the heart, and each gave most distinct results pointing to an increase of the tonic. After the introduction of a small quantity of β lutidine into the system, stimulation of the vagus failed to cause a cessation of the heart's beat.

In frogs retaining their spinal cord the injection of the alkaloid removed all powers of reflex action, which removal the authors proved by other experiments to be due to the β lutidine acting on the reflex centre. The alkaloid was found to be antagonistic to strychnine: removing strychnine-tetanus when injected after that alkaloid and preventing its appearance when injected beforehand.

Chemical Society, May 19.—Prof. Roscoe, president, in the chair.—The following papers were read:—On ammonium nitrite and the reaction between hydrogen and nitric oxide in the presence of spongy platinum, by L. T. Wright. The author has repeated the experiments recently made by G. S. Johnson, who stated that the synthesis of ammonia was effected by passing hydrogen and nitrogen over heated spongy platinum. The author states that the nitrogen was contaminated with nitric oxide. The substance used by Johnson—ferrous sulphate solution—for freeing the nitrogen from nitric oxide does not completely absorb that gas. When pure nitrogen obtained by the action of potassium hypobromite on ammonium chloride, or by passing the nitrogen evolved by heating ammonium nitrite through an alkaline sulphite, was used no ammonia was formed. Hydrogen reacts upon nitric oxide in the presence of cold spongy platinum to form ammonia.—On the synthetical production of urea from benzol, ammonia, and air by the action of heated platinum, by E. F. Herroun. The author has aspirated air through benzol and ammonia, and then passed the mixed vapours over a heated spiral of platinum wire. Urea was formed, which was identified by its reactions and analysis. Acetylene can be substituted for benzol vapour.—On a proposed volumetric method for the ready estimation of a soluble sulphite and free sulphurous acid, or of free sulphurous and sulphuric acids even in the presence of sulphates, by O. V. Pisani.—On the identification of crystallised alkaloids by the microscope, and the use of polarised light, by A. Percy Smith.—On the colour-properties and colour-relations of the metals of the iron-copper group, by T. Bayley. The author continues in this paper his investigations as to the quantities of cobalt and nickel, or of cobalt, copper, and iron, which, when mixed as sulphates, produce colourless grey solutions.—On the effects of the growth of plants on the amount of matter removed from the soil by rain, by E. W. Prevost.—On the action of sodium on cinnamic ether, by F. Hatton.

Physical Society, May 14.—Prof. Fuller in the chair.—New Members: Mr. D. J. Blakely and Mr. Walter Kilner.—Prof. G. C. Foster read a communication from Prof. Rowland and Mr. E. H. Nichols of Baltimore, U.S., on electric absorption in crystals. According to the theory of Clausius, Maxwell, and others there should be no electric absorption in the case of perfectly homogeneous substances. Prof. Rowland tested this deduction in the case of glass, which is not quite homogeneous, quartz, and calcite. This was done by placing the material as the dielectric in a condenser formed of two amalgamated copper plates. The condenser was charged by six Leyden jars, and the absorption measured by a quadrant electrometer. The results were that quartz had about one-ninth the absorptive power of glass, and calcite none at all. Dr. Hopkinson said that the kind of glass was important, and threw doubts on the theory that the absorption was due to heterogeneity; paraffin wax had little absorptive power, and yet was very heterogeneous. Professors Perry and Ayrton thought that two non-homogeneous substances in combina-

tion might have no residual charge. Mr. Lewis Wright suggested that the optical character of crystals should be considered in these experiments, which might be extended to other crystals. Calcite is uniaxial.—Prof. Minchin, of Cooper's Hill, Engineering College, described his new absolute sine electrometer. This consists of two metal plates, in one of which is an aperture nearly closed by a metal trap-door suspended from the plate by two fine platinum wires, and resting against fine stops, when the plates are hung vertically. These plates are connected to the poles of the cell to be measured, and tilted out of the vertical till the attraction of the whole plate on the suspended trap or shutter is just balanced by the weight of the latter. The electromotive force is then proportional to the sine of the angle of displacement. Dr. Lodge remarked that the apparatus combined sensitiveness with practicability. The E.M.F. of a single cell could be measured by it, whereas Thomson's absolute electrometer could only give the total of a number of cells. Prof. Ayrton stated that he and Prof. Perry hoped to modify the instrument in the direction of sensitiveness by adding another plate and giving it a high charge. Dr. Coffin suggested reversing the process of taking an observation.—Prof. Foster read a paper by Dr. J. E. Mills, on the ascent of hollow glass balls through liquids. A glass ball of a pear shape rises through a liquid with a sensibly uniform velocity, which varies with the liquid. The time of ascent is proportional to the square of the diameter of the vessel, and depends of course on the specific gravity of the contents of the bulb. Dr. Mills measures the density of gases and liquids in this manner. Prof. Perry thought that the bulb should be of a shape having no re-entrant angles.

Geological Society, May 11.—R. Etheridge, F.R.S., president, in the chair.—Joseph Deeley, George Kilgour, Griqualand West, South Africa, and Roderick William MacLeod were elected Fellows of the Society.—The following communications were read:—Notes on the fish-remains of the bone-bed at Aust, near Bristol, with the description of some new genera and species, by James W. Davis, F.S.A., F.G.S. The fossil fishes described in this paper are from the Rhætic bed at Aust Passage. The fishes belong to the orders Plagiostomi and Ganoidei, some of the former being of considerable size. It is inferred, from the intermixture of Saurians and fishes, that the deposit is the result of shallow water existing near land, in which the fishes lived and the Saurians occasionally disported themselves. Besides the fossil remains of the animals which lived during the deposition of the Aust-beds, there are also others which appear to have been derived from the Mountain Limestone and the Coal-measures, representing such genera as *Psammodus*, *Psphodus*, *Helodus*, and *Ctenoptychius*.—On some fish-spines from the Coal-measures, by J. W. Davis, F.S.A., F.G.S.—The author described in this paper three species of a new genus of fossil fish from the Carboniferous formation, two of the species having been found in the Cannel coal of the West Riding of Yorkshire, and the other in the Burghlea limestone, near Edinburgh. *Anodontacanthus* is a straight spine, offering many points of resemblance to some of the *Pleuracanthus*; it has a similarly close-grained microscopical structure, the internal cavity opens terminally at the base of the spine, and it was not deeply implanted in the flesh of the fish. It however differs from all the *Pleuracanthus* in being quite free from external denticles; its surface is plain or but slightly striated, whilst that of *Pleuracanthus* always possesses a double row of denticles either ranged laterally along the exposed part of the spine or in some position between the lateral and posterior aspects of the spine. It is possible that evidence may be discovered which will render necessary the removal of these spines to the genus *Pleuracanthus*; but at present there is no evidence that such is advisable. All the specimens of *Pleuracanthus*-spine found associated with teeth or shagreen have been armed with the double row of denticles, and at present no evidence exists that spines without denticles were associated with remains of this genus. It is therefore considered best to institute a new genus for the three species with the name *Anodontacanthus*, in allusion to its having no teeth or denticles.—On some specimens of *Diatopora* and *Stomatopora* from the Wenlock limestone, by Francis D. Longe, F.G.S. Mr. Longe showed and described some specimens of Bryozoa from the Wenlock limestone of Dudley, which he compared with corresponding forms from the Oolites and later periods, and pointed out the close similarity of the Silurian with the later forms, in respect of the shape and dimensions of the cells, as well as in the habit of coenocic growth.—On a new species of *Plesiosaurus*